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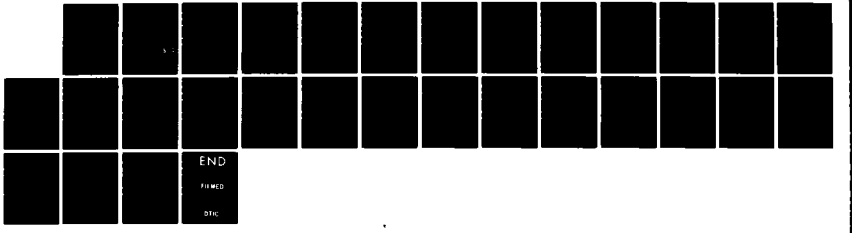

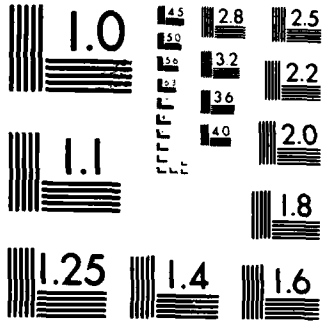


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Three alternative models of causal relations between job perceptions and job satisfaction were tested using confirmatory analytic techniques. The three causal models are: (a) a postcognitive-nonrecursive model in which job satisfaction occurs after job perceptions in the causal order, and job perceptions and job satisfaction are reciprocally related; (b) a precognitive-recursive model in which job perceptions occur after job satisfaction in the causal order and are effects but not causes of job satisfaction; and (c) a precognitive-

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nonrecursive model in which job satisfaction occurs prior to job perceptions, and job satisfaction and job perceptions are reciprocally related. Results of confirmatory analyses indicated disconfirmation of all but the postcognitive-nonrecursive model.

## Confirmatory Analytic Tests of Three Causal Models Relating Job Perceptions to Job Satisfaction

A recent confirmatory analytic study tested the hypothesis that job perceptions and job satisfaction are reciprocally related (James & Jones, 1980). Job perceptions were defined as cognitive representations of job attributes that reflect the psychological meaning and significance of these attributes to individuals (i.e., the perceived autonomy, challenge, and importance associated with jobs -- cf. Jones & James, 1979). Job satisfaction was defined as an affective response to job and task events (cf. Locke, 1976). The theoretical rationale for the job perception -> job satisfaction portion of the reciprocal causal relation was that job perceptions mediate relations between environmental events and affective reactions to these events, which is to say that individuals respond affectively to jobs in terms of how the jobs are cognitively represented or perceived (cf. Brass, 1981; Hackman & Oldham, 1976; Locke, 1976; Oldham & Hackman, 1981; Rousseau, 1977, 1978-a, 1978-b). The mediation relation is shown in Model A of Figure 1 as job attributes and workgroup structure -> job perceptions -> job satisfaction. Also depicted in Model A is the reciprocal loop from job satisfaction to job perceptions. The theoretical rationale for this causal relation was that existing or desired levels of affect may cause individuals to be selectively attentive to, or to redefine, situational cues in cognitive processing, or to restructure

cognitions to make them consistent with beliefs and expectations (implicit theories) regarding whether a job should be satisfying or dissatisfying (James, Hater, Gent, & Bruni, 1978; James & Jones, 1974, 1976, 1980; James & Sells, 1981).

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Insert Figure 1 about here

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Results of a two-stage least squares analysis supported the reciprocal causation hypothesis. These results suggested that a nonrecursive, postcognitive model -- that is, a model based on a reciprocal causal direction with affect following cognition in the causal order -- furnished a useful explanation of the data. It is noteworthy, however, that empirical support for this model is predicated on the ubiquitous assumption the affect follows cognition in the causal order. Recently, Zajonc (1980, 1984) has challenged the assumption that affect is postcognitive. Zajonc (1980, 1984) proposed that affective reactions are precognitive in the sense that they precede differentiated cognitions, namely recognition memory and feature discrimination. This implies that perceptions such as a job is "challenging" follow affective satisfaction reactions inasmuch as imputing psychological meaning and significance to a job is contingent on recognition memory and feature discrimination (James et al., 1978). The Zajonc (1980, 1984)

position suggests further that job perceptions serve to explain or to justify affective satisfaction reactions to objective job characteristics. For example, "I am satisfied; therefore the job must be challenging."

Two precognitive models that appeared applicable to relations between job satisfaction and job perceptions are presented in Models B and C of Figure 1 (these models are based on Zajonc, 1980, Figure 2, p. 161, and Figure 5, p. 170). In addition to precognitive causal orders, Model B assumes a recursive (unidirectional) causal direction, whereas Model C assumes a reciprocal or nonrecursive causal direction. The latter relation is predicated on the rationale that once differentiated cognitions are formed, these cognitions may feed back and stimulate at least some change in affective responses.

A precognitive hypothesis has been tested in only a few studies (cf. Zajonc, 1980, 1984), and only one study has addressed the supposition that job satisfaction precedes job perceptions (Caldwell & O'Reilly, 1982). The latter study was designed primarily to demonstrate that perceived task characteristics (job perceptions) were functions of job satisfaction -- a finding that is consistent with the James and Jones (1980) study. However, Caldwell and O'Reilly (1982, pp. 366, 367) concluded that their results might also be interpreted as supportive of a precognitive model, such as Model B or Model C. We suggest caution in regard to this conclusion, a key reason being that the causal model underlying Experiment 1 (a

true experiment) in the Caldwell and O'Reilly study was, in effect: satisfaction social cues -> job satisfaction -> job perceptions. Support for this model has little to say about the precedence of job satisfaction in Models B or C in Figure 1 because this model does not include (objective) job attributes (task characteristics) as causal variables. Indeed, it is not unreasonable to expect job perceptions to follow job satisfaction in response to a stimulus -- satisfaction social cues -- designed to influence affect. Caldwell and O'Reilly also conducted a correlational study, but, as noted by these authors and a host of others (cf. Duncan, 1975; James & Brett, 1984), causal hypotheses such as causal order cannot be tested meaningfully with exploratory methods.

In sum, it is our belief that the precognitive hypothesis relating job satisfaction to job perceptions needs additional examination. The objective of the present study is to furnish tests of Models B and C and to compare the results of these tests with tests for Model A in order to ascertain which model(s) has the best "fit" with the data. Tests for each causal model are based on confirmatory analytic techniques which allow for assessments of both causal order and causal direction.

## Method

Primary data. The data used here are the same as those employed by James and Jones (1980) to test Model A, and are

summarized briefly. A heterogeneous sample of jobs and work contexts was selected to attempt to insure significant variation in job attributes and workgroup structure. The following five subsamples of nonsupervisory individuals were involved in analyses: (1) systems analysts and programmers from a private health care program ($n$ = 113); (2) incumbents of less technical jobs (e.g., computer operators) from this same program ($n$ = 40); (3) firefighters from a metropolitan fire department ($n$ = 260); (4) production line personnel from four small, paper product manufacturing plants ($n$ = 164); and (5) nonproduction, "white collar" personnel (e.g., sales persons) from the same four plants ($n$ = 65). These 642 individuals furnished data on questionnaire items representing job perceptions and job satisfaction as well as on items representing personal characteristic and demographic variables (to be discussed shortly). The job perception variable was based on a composite of 14 items designed to measure job challenge, job autonomy, and job importance (coefficient alpha [$\alpha$] = .83). Job satisfaction was assessed by a unifactorial composite of seven items ($\alpha$ = .80) that measured satisfaction with job and task events.

The situational variables in Figure 1 involved (1) job complexity (3 items, average intercorrelation [$\bar{r}$] = .52), (2) job pressure (2 items, $\bar{r}$ = .29), (3) boundary-spanning (2 items, $\bar{r}$ = .48), (4) specialization of workgroup structure (division of workgroup labor obtained from job descriptions and organizational records), and (5) standardization of workgroup procedures (3 items,

$\bar{r}$ = .26). Variables 1 through 3 are the job attribute variables and were based on workgroup supervisors' (N = 173) descriptions of each unique job-type in their workgroups. Variables 4 and 5 are measures of workgroup structure; items for standardization were also completed by supervisors. The use of workgroup supervisors, job descriptions, and organizational records to obtain the job attribute and structure data represented an attempt to avoid methodological confounding between situational variables and job perception and job satisfaction variables. It is noteworthy that the five subsamples differed significantly and in expected directions on all five job attribute and structure variables (James & Jones, 1980, Table 3, p. 116). This is one of several important indicators of the construct validity and reliability of these variables (cf. James & Jones, 1980).

Confirmatory analysis. Patterns of estimated parameters (i.e., estimated causal effects) predicted by each of the three causal models are presented in Table 1. The pattern of predicted estimates for each model was based on a priori expectations regarding whether the estimate of each structural parameter should be *nonsignificantly* different from zero, indicating no direct causal effect (0), or significantly different from zero, indicating a direct causal effect having either a positive (+) or a negative (-) influence. Statistical estimates of structural parameters were then obtained using confirmatory analysis. If the pattern of predicted estimates of structural parameters was consistent with the pattern of

empirical estimates of structural parameters, then the causal model was said to have a "good fit" with the data. A good fit implies that predictions derived from a causal model have been confirmed and that the causal model is useful for making causal inferences regarding how events in the causal model might have occurred. A "poor fit" or disconfirmation of predictions was indicated by inconsistencies between the pattern of predicted estimates and the pattern of actual estimates of parameters. Disconfirmation denotes that the causal model is not useful as a basis for explanation.

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Insert Table 1 and Figure 2 about here

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An omnibus model underlying all confirmatory analyses is presented in Figure 2. Each set or pattern of predictions in Table 1 reduces Figure 2 to one of the three competing causal models in Figure 1. Figure 2 also contains personal characteristic and demographic variables believed to be direct causes of job perceptions and/or job satisfaction. These variables were included in the James and Jones (1980) study because perceptions and affective responses were viewed as causal functions of assimilations toward personalistic predispositions and frames of reference. Moreover, these variables were needed to identify the equations used to conduct the two-stage least squares (2SLS) analysis. The personal characteristic and

demographic variables fulfill similar roles in this study and were employed in all analyses. However, the pattern of predicted estimates of structural parameters for these variables is the same in each of the three models. It follows that these variables cannot be used to distinguish among the models and thus they receive only minor attention in this article.

Each model has a unique pattern of predicted estimates of structural parameters in Table 1. $\hat{\underline{B}}_{12}$ and $\hat{\underline{B}}_{21}$ represent the estimates of the structural parameters linking the two endogenous or dependent variables. The $\hat{\underline{C}}_{ik}$ represent estimates of the structural parameters linking the $\underline{K}$ exogenous or independent situational variables ($\underline{k}$=1,...,$\underline{K}$=5) to one of the endogenous variables ($\underline{i}$=1,2). To illustrate interpretation of these patterns, consider the pattern for Model A. Job perceptions are expected to have a direct, positive effect on job satisfaction ($\hat{\underline{B}}_{21}$ is +). Job satisfaction is also expected to have a reciprocal, positive causal effect on job perceptions ($\hat{\underline{B}}_{12}$ is +). The situational variables are predicted to have direct causal effects on job perceptions ($\hat{\underline{C}}_{11}$ through $\hat{\underline{C}}_{13}$ are +, $\hat{\underline{C}}_{14}$ and $\hat{\underline{C}}_{15}$ are -). However, the situational variables are not expected to have direct causal effects on job satisfaction when controls are in place for job perceptions ($\hat{\underline{C}}_{21}$ = ... = $\hat{\underline{C}}_{25}$ = 0).

Three analytic procedures were used to obtain statistical estimates of the structural parameters. The first procedure was

multiple regression, which was used to estimate the values of the structural parameters predicted to be nonzero in the recursive model (Model B). The second procedure was 2SLS, which furnished estimates of the nonzero structural parameters in the two nonrecursive models (James & Singh, 1978). The third procedure, the disturbance term regression test, involved assessments of predictions of the form situational variable -> job satisfaction = 0 in Model A (i.e., $\hat{\underline{C}}_{21} = \ldots = \hat{\underline{C}}_{25} = 0$), and situational variable -> job perceptions = 0 in Models B and C (i.e., $\hat{\underline{C}}_{11} = \ldots = \hat{\underline{C}}_{15} = 0$). The algebraic basis for this test was presented by Miller (1971) and James and Singh (1978), and its use is illustrated in James and Jones (1980) and Schmitt and Bedeian (1982).

## Results

Results of the confirmatory analyses are reported in Table 2, which includes (a) the predicted pattern of estimates of structural parameters from Table 1, and (b) empirical estimates of the structural parameters. The estimates are presented in the form of standardized structural coefficients or "path coefficients" (analyses based on unstandardized structural coefficients furnished identical conclusions). The designation "ns$\underline{r}$" in Table 2 denotes that the zero-order correlations between job satisfaction and the situational variables boundary-spanning ($\underline{X}_3$) and standardization of personnel procedures ($\underline{X}_5$) were nonsignificant. Nonsignificant correlations indicate that these situational variables could not have direct,

linear, and additive effects on job satisfaction (James & Jones, 1980). Poor fits between predicted estimates of structural parameters and empirical estimates of these parameters, and nsrs, are indicated by brackets. Finally, the estimates of multiple correlations reported at the bottom of Table 2 convey the information that variables of major causal significance were included in the functional equations, although multiple correlations should not be used to test the fit of causal models (Duncan, 1975; Hout, 1977).

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Insert Table 2 about here

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Comparisons of the patterns of predicted versus estimated path coefficients indicate that Model A was "essentially confirmed." It is evident that the single source of inconsistency, namely the nonsignificant $\hat{c}_{13}$ (i.e., $\hat{c}_{13} = .04$; $p > .05$), is a minor exception to a general pattern which indicated that job perceptions were functions of the situational variables, as predicted. Thus, boundary-spanning ($X_3$) could be "theory-trimmed" from this causal model without engendering major violence to the basic premise that job perceptions are influenced directly by job attributes and workgroup structure. It is further indicated that job satisfaction is postcognitive inasmuch as predictions $\hat{c}_{21} = \ldots = \hat{c}_{25} = 0$ were confirmed. Finally, the predicted nonrecursive relation between job perceptions and job satisfaction was confirmed because both

$\hat{B}_{12}$ and $\hat{B}_{21}$ were significant. (Results for predictions involving the personalistic and demographic variables also furnished strong support for Model A [James & Jones, 1980]).

The confirmatory analyses for Models B and C indicate that job satisfaction is not precognitive and thus these models were disconfirmed.. The patterns of significant $\hat{C}_{1k}$ in Model B ($\hat{C}_{11}$, $\hat{C}_{14}$, $\hat{C}_{15}$) and Model C ($\hat{C}_{12}$, $\hat{C}_{14}$, $\hat{C}_{15}$) imply that situational variables affect job perceptions <u>directly</u> after controls are in place for the intervening job satisfaction variable. This is really all that needs to be said about these models because (a) interpretations of estimates of parameters predicted to be signficantly different from zero are (b) contingent on first demonstrating that estimates of parameters predicted to be nonsignificant are indeed approximately equal to zero (James et al., 1982). To be specific, the pattern of significant $C_{1k}$ in Model B and Model C indicates that these models are misspecified in regard to causal order, from which it follows that estimates of the nonzero parameters are both biased and inconsistent for both models. An illustration of statistical inconsistency is the bizarre estimate of -.45 for the job perception -> job satisfaction relation ($\hat{B}_{21}$) in Model C. This estimate is traceable to a combination of multicollinearity and suppressor effects that resulted from entering a seriously misspecified model into a 2SLS analysis.

## Discussion

The confirmatory analyses support the causal inferences that job

satisfaction is postcognitive and that the causal relation between job perceptions and job satisfaction is reciprocal. The reciprocal nature of the causal relation was the subject of the James and Jones (1980) study; the present discussion focuses on the postcognitive issue. Empirical support for a postcognitive model affirms what most industrial and organizational psychologists have long believed to be the causal ordering among cognitions of jobs and affective responses to jobs (cf. Hackman & Lawler, 1971; Locke, 1976). This causal order is in turn a manifestation of more basic psychological models which have regarded emotion (affect) as postcognitive (cf. Bandura, 1978; Endler & Magnusson, 1976; Lewin, 1938; Mischel, 1973; Stotland & Canon, 1972). It would be redundant to review these and related literatures because postcognitive models are generally intrinsic to the training of an industrial and organizational psychologist. However, brief attention to a key point raised by Lazarus (1982) in response to the Zajonc (1980) helps to explain the results of the present study.

The core issue in Lazarus' critique of precognitive models was that "cognitive processes are always crucial in the elicitation of an emotion" (1982, p. 1024) because emotional responses in humans are elicited "by a complex cognitive appraisal of the significance of events for one's well-being" (1982, p. 1019). Lazarus (1982) stated also that essentially immediate emotional responses to situational stimuli do not connote the absence of cognitive processing. In fact, Lazarus rejected Zajonc's description of contemporary cognitive

processing models because Zajonc portrayed cognitive processing as being based largely on a sequential chain of information processing events involving deliberate reflection, rationality, and awareness. Lazarus (1982, p. 1022) argued instead that "cognitive activity in appraisal does not imply anything about deliberate reflection, rationality, or awareness." Points similar to these have a long history in social cognition and perception, and are key assumptions in the psychological climate model on which the present study of job perception and job satisfaction was based (James & Jones, 1980; James & Sells, 1981).

These points as well as others raised by Lazarus (1982, 1984) suggest that precognitive causal models are theoretically untenable. The results of the present study suggest that precognitive causal models are empirically untenable as well. Of course, one study of causal order does not provide sufficient empirical evidence to make the general inference that postcognitive models are preferable to precognitive models. Even if attention were limited to job perceptions and job satisfaction, we have no "proof" that cognitions occur prior to affective responses or that cognitions and affect are reciprocal causes of one another. We can only say that among the models tested in this study, the postcognitive- nonrecursive model was the only causal model that justified the inference that the model is <u>useful</u> for explaining relations between job perceptions and job satisfaction. On the other hand, models that were not tested in the present analysis might provide at least as good an explanation of the

relations between job perceptions and job satisfaction as Model A. There is, therefore, a need to develop and test additional alternatives to the postcognitive-nonrecursive model.

The need also exists to address limitations of the present study in future research. An attempt was made to satisfy reasonably the assumptions or conditions for confirmatory analysis (see James & Jones, 1980). As with most if not all such attempts, less than total success was achieved. A particular concern for some reviewers was lack of self-containment or an unmeasured variables problem (James, 1980). A stronger case for reasonable satisfaction of the self-containment condition could have been made had social variables such as social cues for job perceptions (and job satisfaction) been included in the study. Also, use of time-series analysis with multiple waves of measurement of all variables would have furnished a basis for testing the stability of the model and an alternative, statistical method for dealing with unmeasured variables (cf. Fair, 1970; James & Singh, 1978; James & Tetrick, in press; Johnston, 1972). Questions regarding the reliability and construct validity of the data also remain. The data were not perfectly reliable, and the effects of nonrandom measurement errors such as method variance (cf. Costner, 1969; Namboodiri et al., 1975; Roberts & Glick, 1981) could be addressed only partially (see James & Jones, 1980). Issues pertaining to reliability and construct validity could be dealt with more completely in future research by designing and implementing

latent variable structural models (cf. Bentler, 1980; James et al., 1982; Jöreskog & Sörbom, 1979).

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## Author Notes

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Table 1

Predicted Estimates of Structural Parameters Used to Determine the Goodness of Fit for Each of Three Causal Models

| Estimated Parameter | Model A Postcognitive-Nonrecursive | Model B Precognitive-Recursive | Model C Precognitive-Nonrecursive |
|---|---|---|---|
| Endogenous Variables | | | |
| $\hat{B}_{12}$ | + | + | + |
| $\hat{B}_{21}$ | + | 0 | + |
| Situational Variables | | | |
| $\hat{C}_{11}$ | + | 0 | 0 |
| $\hat{C}_{12}$ | + | 0 | 0 |
| $\hat{C}_{13}$ | + | 0 | 0 |
| $\hat{C}_{14}$ | - | 0 | 0 |
| $\hat{C}_{15}$ | - | 0 | 0 |
| $\hat{C}_{21}$ | 0 | + | + |
| $\hat{C}_{22}$ | 0 | + | + |
| $\hat{C}_{23}$ | 0 | + | + |
| $\hat{C}_{24}$ | 0 | - | - |
| $\hat{C}_{25}$ | 0 | - | - |

Note. Estimates of structural parameters are predicted to be nonsignificant (0), significant and positive (+), or significant and negative (-).

Table 2

Predicted Estimates of Structural Parameters and Observed Estimates of Standardized Structural Parameters for Each of Three Causal Models

| Estimated Parameter | Model A: Postcognitive-Nonrecursive | | Model B: Precognitive-Recursive | | Model C: Precognitive-Nonrecursive | |
|---|---|---|---|---|---|---|
| **Endogenous Variables** | | | | | | |
| $\hat{B}_{12}$ | + .60** | | + .53** | | + .73** | |
| $\hat{B}_{21}$ | + .24** | | [0 ] | | [+ -.45**] | |
| **Situational Variables** | | | | | | |
| $\hat{C}_{11}$ | + .12* | | [0 .16**] | | 0 .08 | |
| $\hat{C}_{12}$ | + .08* | | 0 .08 | | [0 .08* ] | |
| $\hat{C}_{13}$ | [+ .04 ] | | 0 .04 | | 0 .01 | |
| $\hat{C}_{14}$ | - -.12** | | [0 -.15**] | | [0 -.15**] | |
| $\hat{C}_{15}$ | - -.10** | | [0 -.13**] | | [0 -.11**] | |
| $\hat{C}_{21}$ | 0 .03 | | + .09* | | + .17** | |
| $\hat{C}_{22}$ | 0 .00 | | [+ .02 ] | | [+ .05 ] | |
| $\hat{C}_{23}$ | 0 nsr | | [+ nsr ] | | [+ nsr ] | |
| $\hat{C}_{24}$ | 0 -.08 | | [- -.11 ] | | - -.20** | |
| $\hat{C}_{25}$ | 0 nsr | | [- nsr ] | | [- nsr ] | |
| $R^a$ | .58 | .59 | .64 | | .51 | .55 |

Note. Estimates inconsistent with predictions are in brackets. The designation nsr means that the zero-order correlation was nonsignificant ($p > .05$).

[a] Multiple correlation. For Models A and C, the first R is for job perceptions as the endogenous variable and the second R is for job satisfaction as the endogenous variable.

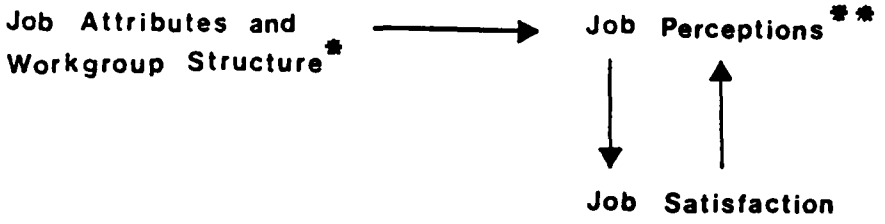
* $p < .05$

** $p < .01$

## Figure Captions

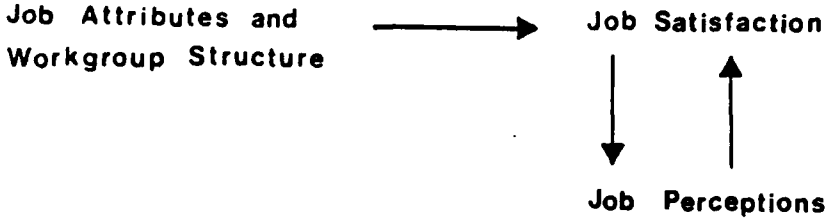
Figure 1. Alternative causal models relating job attributes and workgroup structure to job perceptions and job satisfaction.

Figure 2. Omnibus causal model relating job attributes and workgroup structure to job perceptions and job satisfaction.




Model A: Postcognitive – Nonrecursive

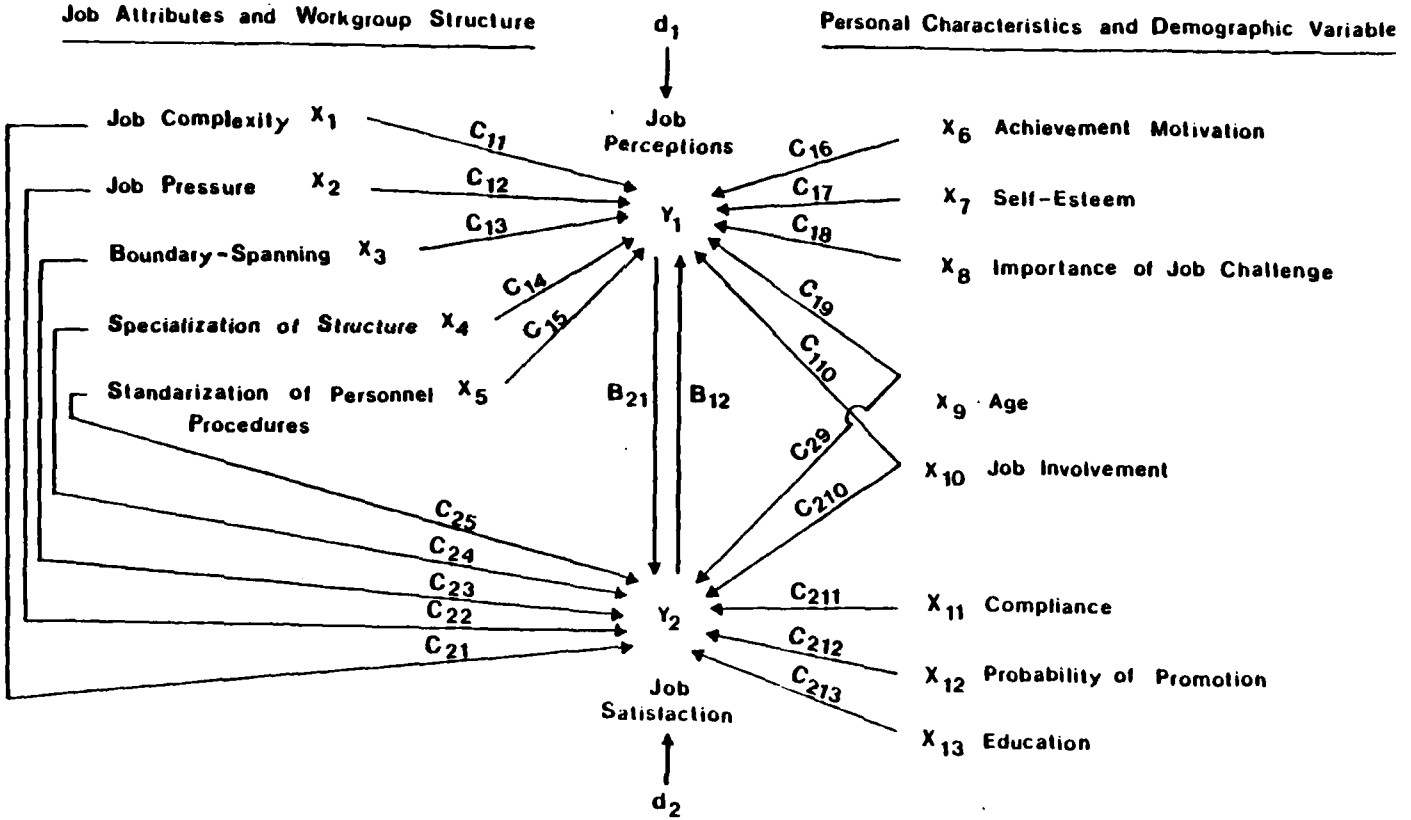

Model B: Precognitive – Recursive




Model C: Precognitive – Nonrecursive

* Job Complexity
Job Pressure
Boundary-Spanning
Specialization of Structure
Standardization of Personnel Procedures

** Job Challenge
Job Autonomy
Job Importance


Job Attributes and Workgroup Structure
Personal Characteristics and Demographic Variable
$d_1$
Job Perceptions
$Y_1$
Job Complexity $X_1$
Job Pressure $X_2$
Boundary-Spanning $X_3$
Specialization of Structure $X_4$
Standarization of Personnel Procedures $X_5$
$C_{11}$
$C_{12}$
$C_{13}$
$C_{14}$
$C_{15}$
$B_{21}$
$B_{12}$
$C_{16}$
$C_{17}$
$C_{18}$
$C_{19}$
$C_{110}$
$C_{29}$
$C_{210}$
$C_{25}$
$C_{24}$
$C_{23}$
$C_{22}$
$C_{21}$
$C_{211}$
$C_{212}$
$C_{213}$
$X_6$ Achievement Motivation
$X_7$ Self-Esteem
$X_8$ Importance of Job Challenge
$X_9$ Age
$X_{10}$ Job Involvement
$X_{11}$ Compliance
$X_{12}$ Probability of Promotion
$X_{13}$ Education
$Y_2$
Job Satisfaction
$d_2$

END

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